



IVS Combination Center at BKG: Preparing the IVS contribution to ITRF2013 and current activities

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Introduction

- Call for participation sent out in March 2013 by IERS ITRS Product Center
- Proposed deadline for all services (IDS, IGS, ILRS, IVS): February 10, 2014.
- Deadline not reached by IVS due to analysis software developments and preparation issues.

Introduction

- Overall amount of ~6000 24h sessions starting in the early 1980s.
- Several Analysis Centers announced their participations, including some new institutions.
- 9-10 contributions are expected for the combination.
 - total amount of ~54 000 – 60 000 SINEX files
- Several discussions on submission instructions, axis offsets, EOP parameterization and source position handling.
- First test files available on the IVS data center on February 10, 2014.
- Currently 5 contributions.

Expected IVS contributions for ITRF2013

AC	Name	Software	Operational AC	ITRF2013 contr.
AUS	Geoscience Australia, Australia	OCCAM	no	yes
BKG	Federal Agency for Cartography and Geodesy, Germany	Calc/(nu)Solve	yes	yes
DGFI	German Geodetic Research Institution	OCCAM	yes	no
GFZ	German Research Center for Geosciences	VieVS	no	yes
GSFC	Goddard Space Flight Center, USA	Calc/(nu)Solve	yes	yes
IAA	Institute of Applied Astrometry, Russia	Quasar	yes	yes
NMA	Norwegian Mapping Authority, Norway	Geosat	no	yes
OPAR	Observatory of Paris, France	Calc/(nu)Solve	yes	open
SHAO	Shanghai Observatory, China	Calc/(nu)Solve	no	yes
USNO	US Naval Observatory, USA	Calc/(nu)Solve	yes	open
VIE	Vienna University of Technology, Austria	VieVS	no	yes

Introduction

Data

Submitted data to IVS Data Center

(ftp://ivs.bkg.bund.de/pub/vlbi/ITRF2013/daily_sinex/)



Status quo April 2014:

- 5 contributions
- 3 of 5 new ACs
- More contributions expected soon

Verzeichnis: ftp://ivs.bkg.bund.de/pub/vlbi/ITRF2013/daily_sinex/

Verzeichnisinhalt:

↑ [Übergeordnetes Verzeichnis \(Stammverzeichnis\)](#)

 aus2013a	Apr 2 05:21
 gfs2013a	Apr 4 17:13
 gsf2013a	Apr 4 13:14
 iaa2013a	Apr 4 11:26
 vie2013a	Feb 26 17:23

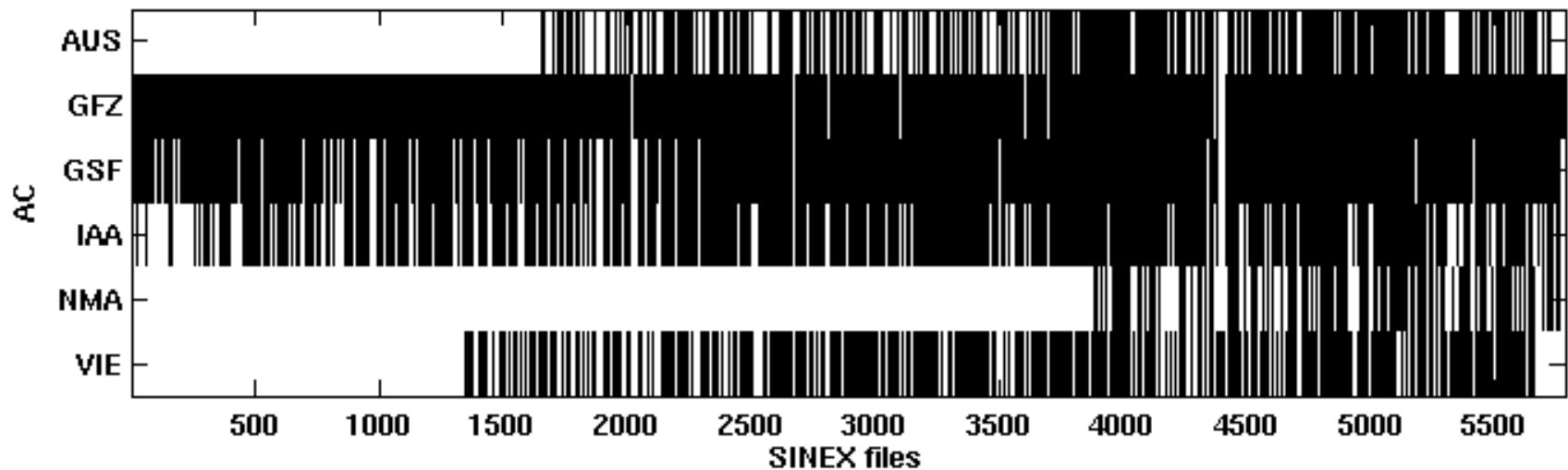
Erzeugt am Wed, 23 Apr 2014 07:17:11 GMT von gate1-f.ifag.de (squid/3.2.13)

Screenshot of IVS Data Center April 23, 2014

Session availability

- Session file availability for current ITRF2013 contributions and test data from NMA

Current Sinex file availability



General Analysis procedure

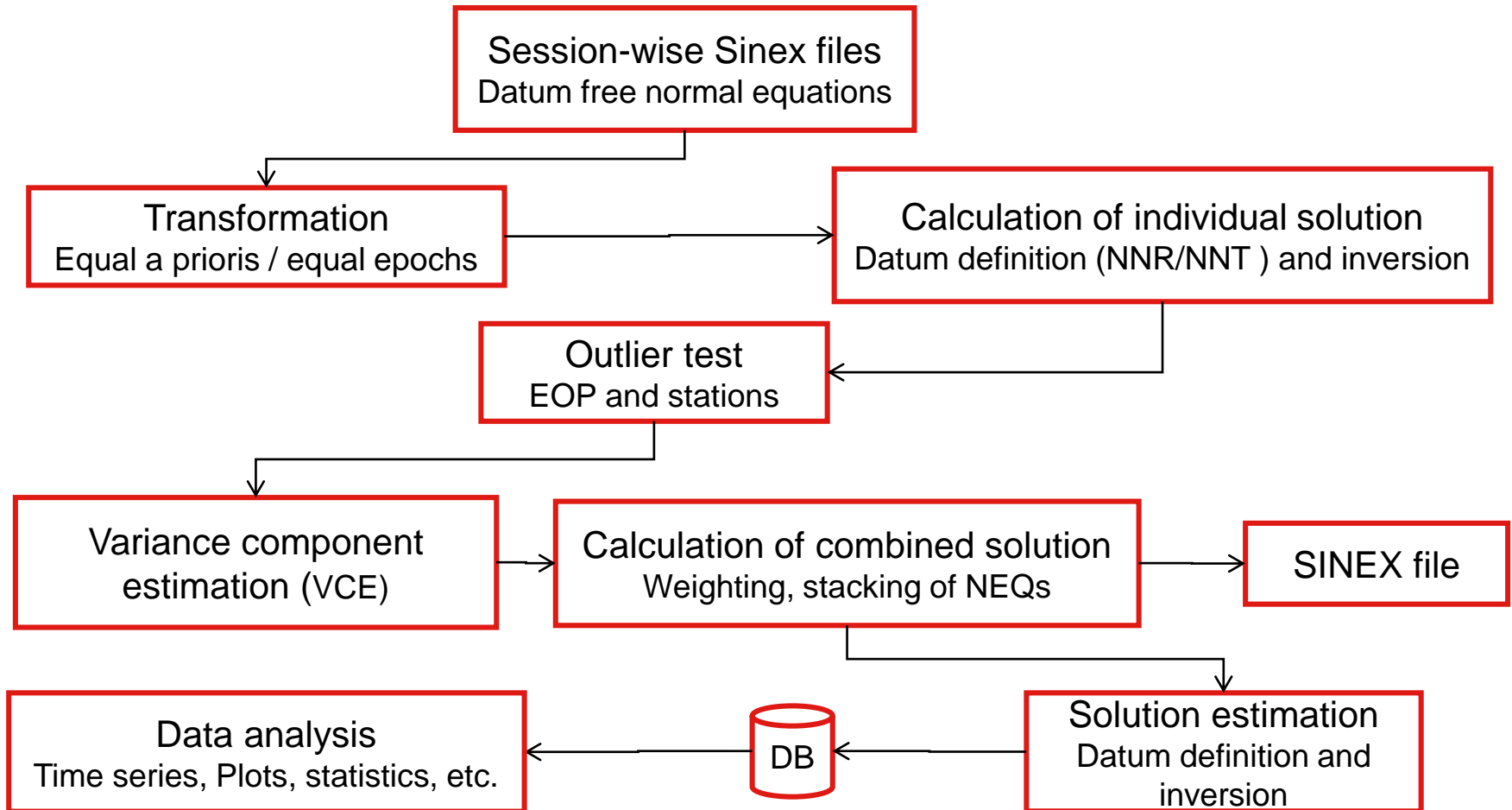
Data:

- Datum free normal equations with station coordinates and EOP
- No source positions
- According to IERS Conventions 2010 (models and constants)

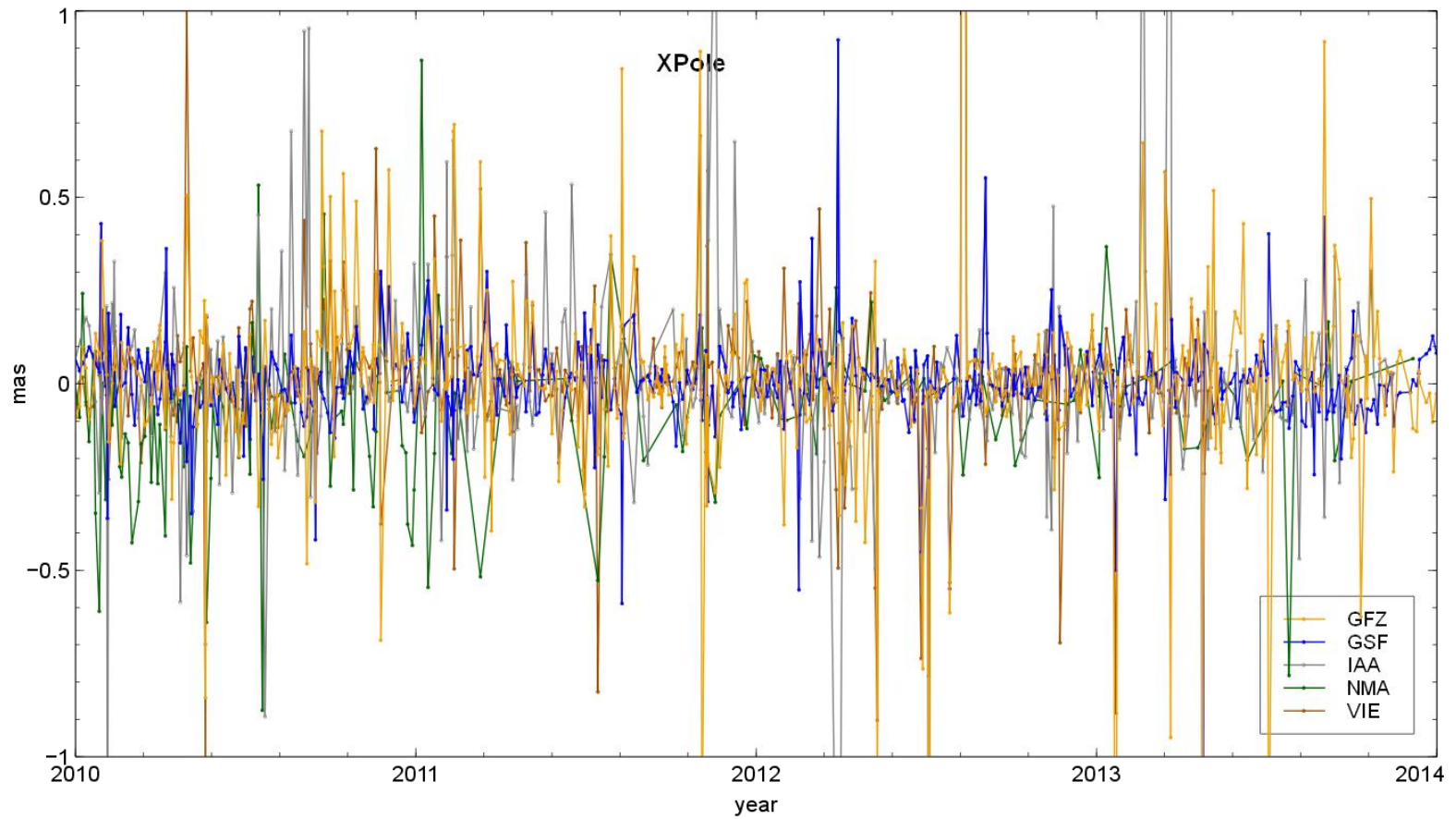
Procedure:

- Similar to operational IVS quarterly combination:
 - Sessions in SINEX file format containing stations coordinates and EOPs.
 - Time span of data: early 1980s to present.
 - Long term solution.

Combination procedure

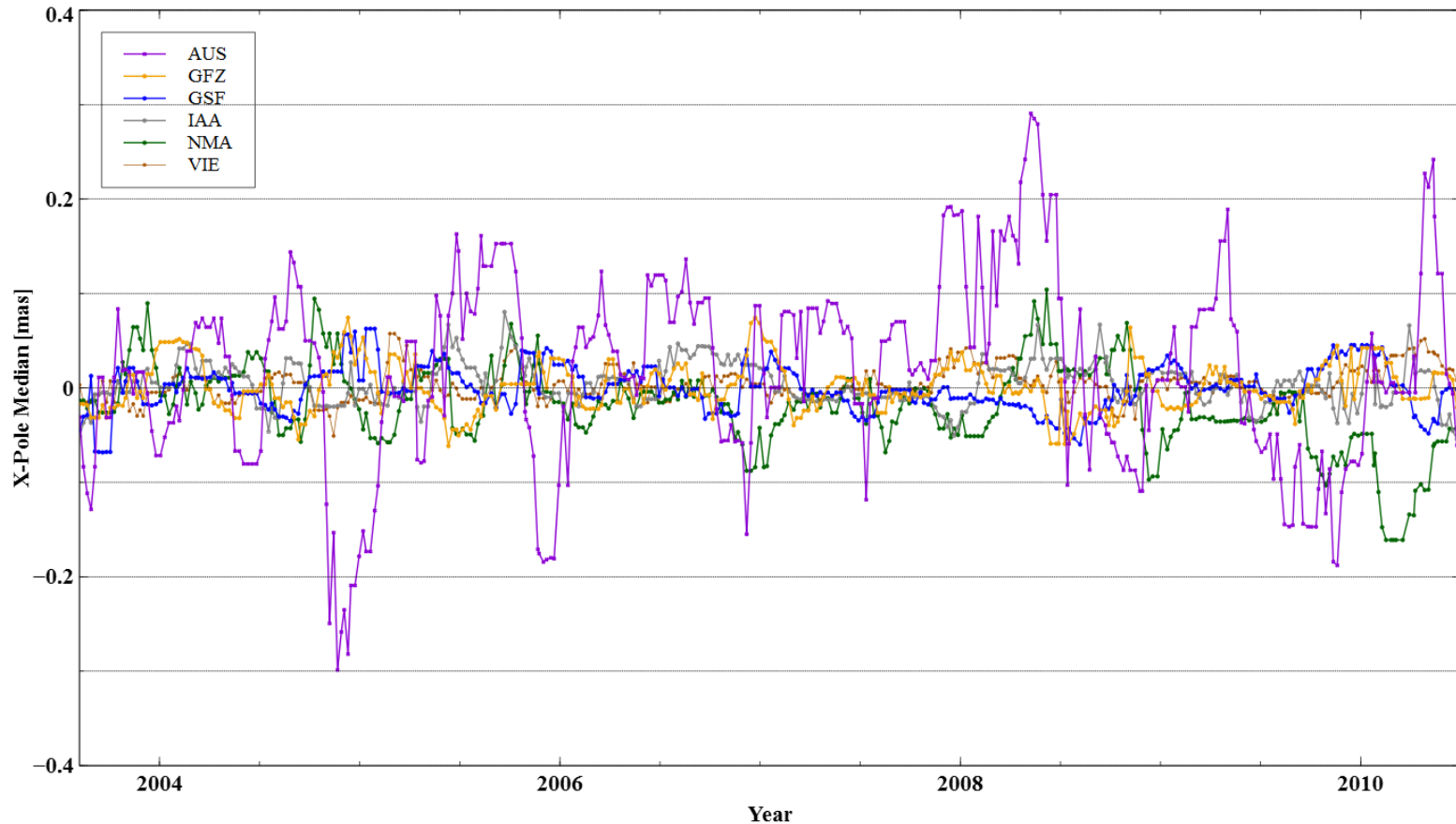


X-Pole residuals



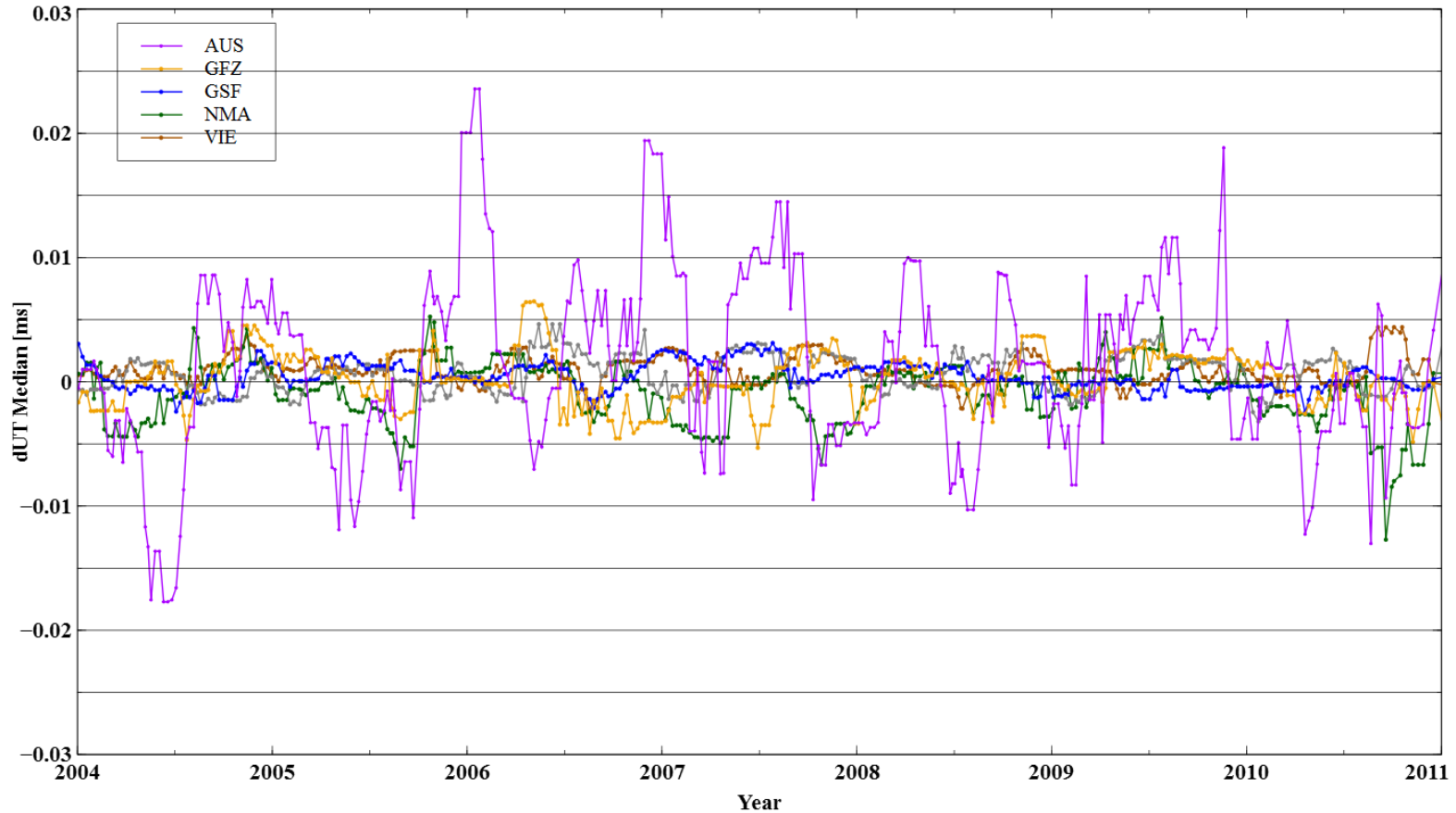
X-Pole Median residuals w.r.t. combined solution

Moving average (90 days)



dUT Median residuals w.r.t. combined solution

Moving average (90 days)



WRMS w.r.t. C04

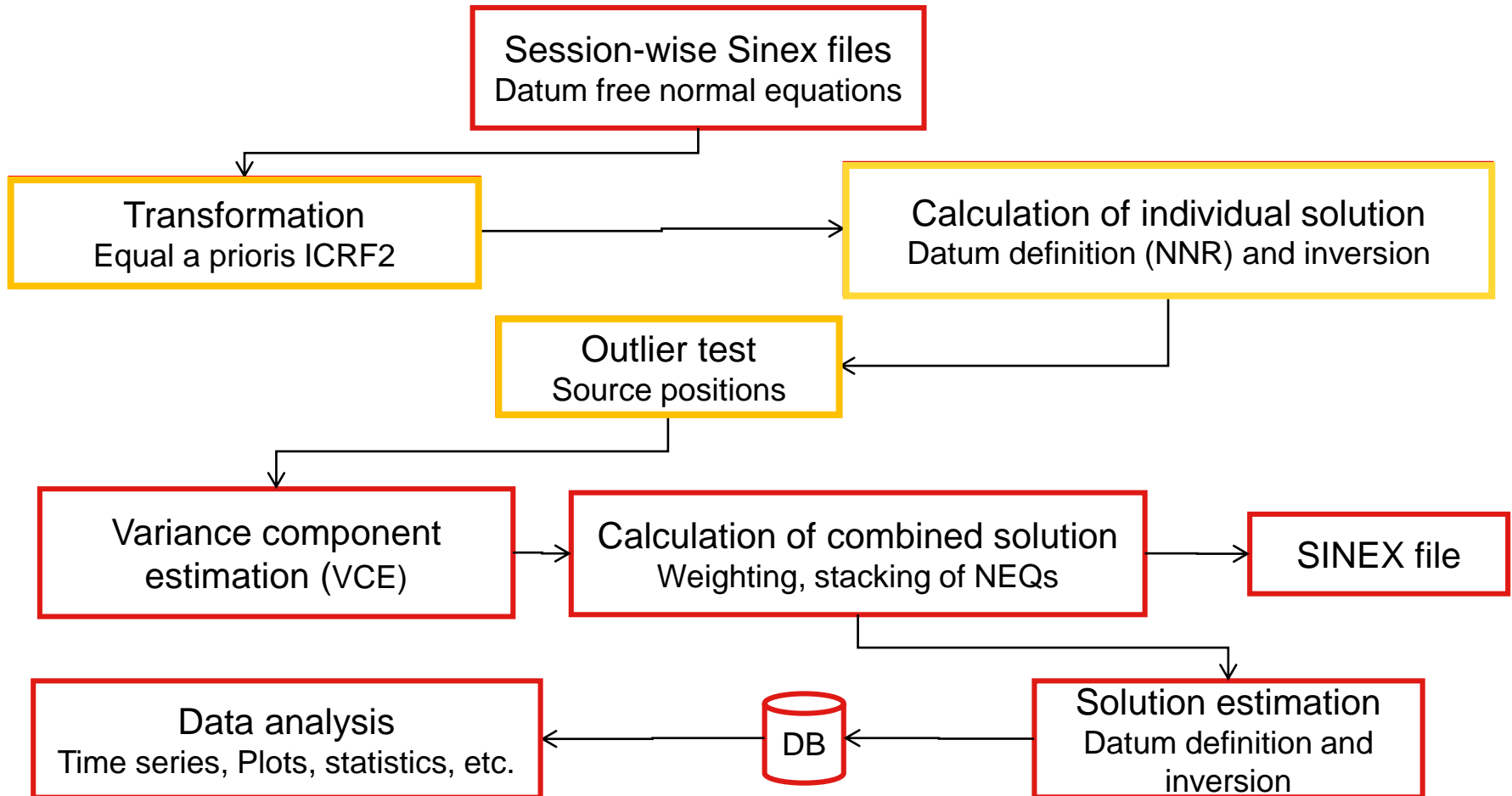
AC	X-Pole	Y-Pole	dUT	LOD	X-PoleR	Y-PoleR	dX	dY
	mas	mas	ms	ms/day	mas/day	mas/day	mas	mas
AUS	0.314	0.366	0.017	0.050	0.737	0.710	NaN	NaN
COMBI	0.121	0.118	0.013	0.046	0.474	0.374	0.052	0.050
GFZ	0.167	0.166	0.012	0.048	0.549	0.495	0.109	0.107
GSF	0.128	0.127	0.013	0.048	0.497	0.400	0.061	0.062
IAA	0.142	0.150	0.013	0.049	0.526	0.450	0.084	0.082
NMA	0.100	0.130	0.037	0.049	0.395	0.329	0.028	0.027
VIE	0.154	0.144	0.013	0.048	0.496	0.441	0.097	0.096
BKG	0.154	0.152	0.014	0.048	0.523	0.446	0.067	0.068
DGF	0.153	0.138	0.039	0.048	0.502	0.403	NaN	NaN
OPA	0.138	0.139	0.013	0.048	0.530	0.422	0.060	0.067
USN	0.140	0.141	0.014	0.048	0.520	0.432	0.074	0.076

Further activities

Combination of source positions

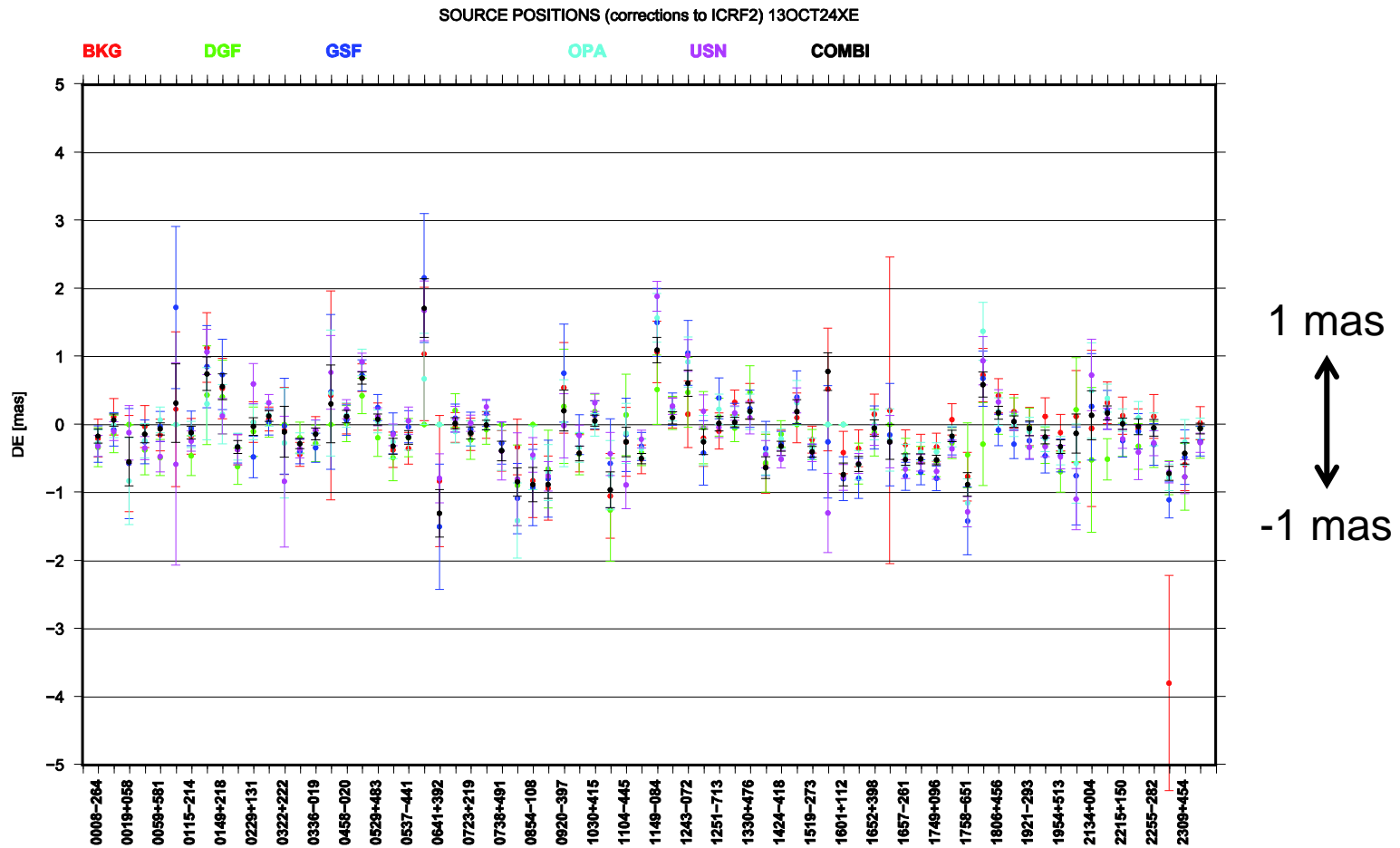
- Source positions are provided by most of the IVS Analysis Centers now.
- Initially foreseen for the ITRF2013.
- Combination routines have been set up to include them.
- First sessions have been combined with good results.
- Combination of single sessions and global solution (CRF).
- Differences to ICRF2 positions +/- 0.2 mas.

Source position combination setup



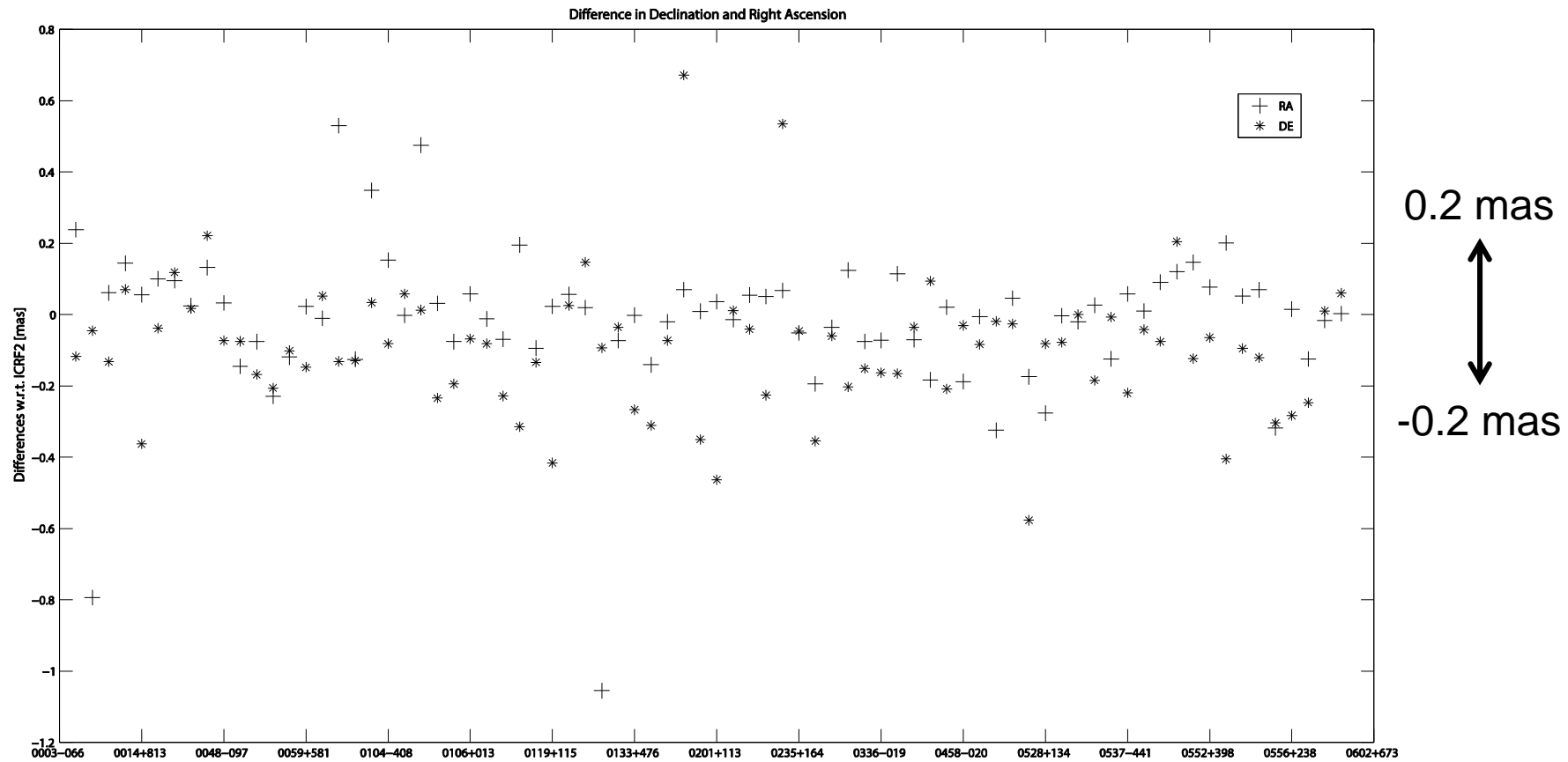
Single session combination

13OCT24XE



Global solution CRF

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Summary

ITRF2013 Preparations:

- Test data available.
- Promising contributions from new institutions.
- First contributions submitted to IVS data center.
- ~~First combined solutions expected for EGU 2014.~~
- First combined solutions expected for June 2014.

Source position combination:

- Originally previewed for ITRF2013 contribution (“wish list”).
- Integrated in the combination routines.
- Further investigations foreseen.

Thank you for your kind attention!

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